This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-30 (canceled)

31. (Previously added) A method for preparing a library of compounds comprising:

contacting a purine or pyrimidine heterocyclic scaffold having at least two functionalizable atoms, wherein at least one of said functionalizable atoms is blocked, with a mixture of at least six different chemical substituents to append each of said chemical substituents to said heterocyclic scaffold directly to form a substituent-appended scaffold;

deblocking at least one of said blocked functionalizable atoms of said substituent-appended scaffold; and

contacting said substituent-appended scaffold with a mixture of at least six different chemical substituents to append each of said chemical substituents to said substituent-appended scaffold either directly or via a tether moiety covalently attached to one of said functionalizable atoms.

32. (Previously added) The method of claim 31 wherein said compounds of said library are within 20 mole percent of equimolarity.

33. (Previously added) The method of claim 31 wherein said contacting steps are carried out in one reaction vessel.

34. (Currently amended) The method of claim 31 wherein said purine or pyrimidine is substituted ~~or unsubstituted~~ adenine, guanine, cytosine, uridine, thymine, xanthine or hypoxanthine.

35. (Previously added) The method of claim 31 wherein said scaffold is contacted with a mixture of at least ten different chemical substituents.

36. (Previously added) The method of claim 31 wherein said scaffold is contacted with a mixture of at least fifteen different chemical substituents.

37. (Previously added) The method of claim 31 wherein said method is performed in solution phase.

38. (Previously added) A method for preparing a library of compounds comprising:

contacting a purine or pyrimidine heterocyclic scaffold having at least two functionalizable atoms, wherein at least one of said functionalizable atoms is blocked, with a mixture of at least six different chemical substituents to append each of said chemical substituents to said heterocyclic scaffold via a tether moiety covalently attached to one of said functionalizable atoms to form a substituent-appended scaffold;

deblocking at least one of said blocked functionalizable atoms of said substituent-appended scaffold; and

contacting said substituent-appended scaffold with a mixture of at least six different chemical substituents to append each of said chemical substituents to said substituent-appended scaffold either directly or via a tether moiety covalently attached to one of said functionalizable atoms.

39. (Previously added) The method of claim 38 wherein said compounds of said library are within 20 mole percent of equimolarity.

40. (Previously added) The method of claim 38 wherein said contacting steps are carried out in one reaction vessel.

41. (Currently amended) The method of claim 38 wherein said purine or pyrimidine is substituted ~~or unsubstituted~~ adenine, guanine, cytosine, uridine, thymine, xanthine or hypoxanthine.

42. (Previously added) The method of claim 38 wherein said scaffold is contacted with a mixture of at least ten different chemical substituents.

43. (Previously added) The method of claim 38 wherein said scaffold is contacted with a mixture of at least fifteen different chemical substituents.

44. (Previously added) The method of claim 38 wherein said method is performed in solution phase.

45. (Previously added) A method for preparing a library of compounds comprising:

contacting a purine or pyrimidine heterocyclic scaffold molecule having a plurality of functionalizable atoms with a mixture of at least six different chemical substituents in one reaction vessel to append each of said chemical substituents to said scaffold either directly or via a tether moiety covalently attached to one of said functionalizable atoms.

46. (Previously added) The method of claim 45 wherein said compounds of said library are within 20 mole percent of equimolarity.

47. (Currently amended) The method of claim 45 wherein said purine or pyrimidine is substituted ~~or unsubstituted~~ adenine, guanine, cytosine, uridine, thymine, xanthine or hypoxanthine.

48. (Previously added) The method of claim 45 wherein said scaffold is contacted with a mixture of at least ten different chemical substituents.

49. (Previously added) The method of claim 45 wherein said scaffold is contacted with a mixture of at least fifteen different chemical substituents.

50. (Previously added) The method of claim 45 wherein said method is performed in solution phase.